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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,672

09/30/2005

Hiromi Matsumura

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01/09/2008

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ALEXANDRIA, VA 22314

EXAMINER

FOGARTY, CAITLIN ANNE

ART UNIT

PAPER NUMBER

4116

NOTIFICATION DATE

DELIVERY MODE

01/09/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/551,672	<b>Applicant(s)</b> MATSUMURA ET AL.	
	<b>Examiner</b> CAITLIN FOGARTY	<b>Art Unit</b> 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 and 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 11-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/30/2005 and 10/12/2006</u> .                               | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election Acknowledged***

1. Applicant's election without traverse of Claims 1-6 and 11-17 in the reply filed on November 28, 2007 is acknowledged.

### ***Status of Application***

2. Claims 1 – 6 and 11 – 17 are pending and presented for the examination.  
Claims 7 – 10 and 18 – 20 have been withdrawn from consideration.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

4. The information disclosure statements (IDSs) were submitted on December 30, 2005 and October 12, 2006, respectively. These submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner. Please refer to applicant's copy of form PTO-1449 submitted herewith.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1 – 6 and 11 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takarasawa et al. (JP 11-061393 cited in the IDS) in view of Rhodes

et al. ("Effects of Friction Stir Welding on Microstructure of 7075 Aluminum" cited in the IDS).

In regards to claims 1 – 4, the abstract and paragraph [0013] (see English machine translation of JP 11-061393) of Takarasawa et al. disclose a Ru sputtering target prepared by the butt joining of metal sheets being made of the same material.

Takarasawa et al. differ from claim 1 because they do not disclose that an intermetallic compound in a joined portion has an average particle diameter of 60% to 130% of the average particle diameter of the intermetallic compound in a non-joined portion. However, Rhodes et al. disclose an aluminum alloy prepared by the butt joining, through friction stir welding, of aluminum sheets (see Experimental Procedure on p. 70). Additionally, Rhodes et al. teach that the weld nugget (joined portion) has an average particle diameter of 60-80 nm and the average particle diameter of the intermetallic compound in the parent metal (non-joined portion) is 50-75 nm (see the Weld Nugget section on p. 73). The average particle diameter of the intermetallic compound in the weld nugget is within the range of 60% to 130% of the average particle diameter of the intermetallic compound in the parent metal.

Takarasawa et al. differ from claim 2 because they do not teach that the average distance between adjacent intermetallic compound particles in a joined portion is 60% to 130% of the average distance between adjacent intermetallic compound particles in a non-joined portion. However, Rhodes et al. disclose that the weld nugget contains a high density of randomly oriented intragranular precipitates (see the Weld Nugget section on p. 73). This suggests that the density of precipitates increased and

consequently the average distance between adjacent intermetallic compound particles decreased from that of the parent metal which is within the range recited in claim 2.

Takarasawa et al. differ from claim 3 because they do not disclose that the average of the grain diameter of metallic crystals in a joined portion is 20% to 500% of the average of the grain diameter of metallic crystals in a non-joined portion. However, Rhodes et al. disclose that the weld nugget has a recrystallized, fine equiaxed grain structure on the order of 2-4  $\mu\text{m}$  in diameter and that the grains of the parent metal were elongated grains (see the sections Weld Nugget on p. 73 and Discussion on p. 74). Therefore, the grains in the weld nugget had smaller diameters than those of the parent metal which is within the range disclosed in claim 3.

Takarasawa et al. differ from claim 4 because they do not teach that no dendritic structure is generated in a joined portion. However, the Introduction on p. 69 of Rhodes et al. teaches that the friction-stir welded joint does not have the dendritic structure typical of a fusion-weld joint.

In regards to claims 5, 12, 13, and 14, dependent on claims 1, 2, 3, and 4, respectively, Takarasawa et al. in view of Rhodes et al. teach the limitations of claims 1 – 4 as discussed above. Takarasawa et al. differ from claims 5, 12, 13, and 14 because they do not disclose that the sputtering target comprises one element selected from the group consisting of aluminum, an aluminum alloy, copper, a copper alloy, silver, and a silver alloy. However, Rhodes et al. teach an aluminum alloy prepared by butt welding aluminum alloy sheets (see Experimental Procedure p. 70).

Regarding claims 6, 15, 16, and 17, dependent on claims 1, 2, 3, and 4, respectively, Takarasawa et al. in view of Rhodes et al. teach the limitations of claims 1 – 4 as discussed above. Takarasawa et al. differ from claims 6 and 15 – 17 because they do not disclose that the sputtering target comprises a planar area of 1 m<sup>2</sup> or more. However, it would have been obvious to one of ordinary skill in the art to make the sputtering target as large as necessary using butt joining of metal sheets made of the same material as disclosed in Takarasawa et al, specifically the friction stir welding method disclosed in Rhodes et al. in order to avoid the formation of dendritic structure in the joined portion.

Claim 11 is dependent on claim 7 which has been cancelled. However, the examiner will assume that the contents of claim 7 are included in claim 11 for the purpose of this examination. In regards to claim 11, the abstract and paragraph [0013] of Takarasawa et al. disclose a Ru sputtering target prepared by the butt joining of metal sheets being made of the same material. Takarasawa et al. differ from claim 11 because they do not teach that the sputtering target is prepared by joining the metallic materials being made of the same material by friction stir welding. However, Rhodes et al. disclose an aluminum alloy prepared by the butt joining, through friction stir welding, of aluminum sheets (see Experimental Procedure on p. 70).

It would have been obvious to one of ordinary skill in the art to modify Takarasawa et al. in view of Rhodes et al. because Rhodes et al. disclose an aluminum alloy, which may be used to make a sputtering target, joined by butt welding, specifically friction stir welding. One would have been motivated to make such modification

because friction stir welding is a more effective method of welding metal sheets made of the same material because the properties of the joined portion do not vary greatly from the properties of the non-joined portion.

### ***Conclusion***

9. No claim is allowed. All pending claims are rejected.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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/Vickie Kim/  
Supervisory Patent Examiner, Art Unit 4116